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General technical information	D1-D31
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Turning Tools

General turning tools
Parting and grooving tools
Threading tools



Turning



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Selection A



Dimensions(mm)				
L	IC	S	D1	RE
12.9	12.7	4.76	5.16	0.4

PZero **PZero R** **PZero C** **PZero S** **PZero T** **PZero V**

From A135 A141 A141 A154 A155 A158

Sport role play
 Daily winter roleplay
 Technical winter roleplay
 Recommended riding scenario



- ◆Tool holder type, Size
- ◆Stock
- ◆Operation gener
- ◆Applicable inserts

DR
Double-
side

A2

Selection B



Dimensions(mm)				
L	IC	S	D1	RE
12.9	12.7	4.76	5.16	0.4

Applicable tool





Guide to select parting and grooving tools

Parting and grooving tools

QE□□□/L

QE□□□/L

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QF□□□□/L

QF□□□□/L

Page A262-265

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External parting, grooving and turning tools

Type	Stock	Basic dimensions (mm)					Applicable inserts	Screw	Material
		R	L	W	HP	DP			
GEAD	1212K-LT	12	12	12	12	12	ZD40Y100	ISO705 H4-V12	PM60
	1212K-L2	12	12	12	12	12	ZD40Y100		PM60
	1212K-LT	12	12	12	12	12	ZD40Y100	ISO705 H4-V12	PM60
	1212K-L2	12	12	12	12	12	ZD40Y100		PM60
	1212K-LT	12	12	12	12	12	ZD40Y100	ISO705 H4-V12	PM60
GEAD	1212K-LT	12	12	12	12	12	ZD40Y100	ISO705 H4-V12	PM60
	1212K-L2	12	12	12	12	12	ZD40Y100		PM60
	1212K-LT	12	12	12	12	12	ZD40Y100	ISO705 H4-V12	PM60
	1212K-L2	12	12	12	12	12	ZD40Y100		PM60
	1212K-LT	12	12	12	12	12	ZD40Y100	ISO705 H4-V12	PM60
GEAD	1212K-LT	12	12	12	12	12	ZD40Y100	ISO705 H4-V12	PM60
	1212K-L2	12	12	12	12	12	ZD40Y100		PM60
	1212K-LT	12	12	12	12	12	ZD40Y100	ISO705 H4-V12	PM60
	1212K-L2	12	12	12	12	12	ZD40Y100		PM60
	1212K-LT	12	12	12	12	12	ZD40Y100	ISO705 H4-V12	PM60
GEAD	1212K-LT	12	12	12	12	12	ZD40Y100	ISO705 H4-V12	PM60
	1212K-L2	12	12	12	12	12	ZD40Y100		PM60
	1212K-LT	12	12	12	12	12	ZD40Y100	ISO705 H4-V12	PM60
	1212K-L2	12	12	12	12	12	ZD40Y100		PM60
	1212K-LT	12	12	12	12	12	ZD40Y100	ISO705 H4-V12	PM60
GEAD	1212K-LT	12	12	12	12	12	ZD40Y100	ISO705 H4-V12	PM60
	1212K-L2	12	12	12	12	12	ZD40Y100		PM60
	1212K-LT	12	12	12	12	12	ZD40Y100	ISO705 H4-V12	PM60
	1212K-L2	12	12	12	12	12	ZD40Y100		PM60
	1212K-LT	12	12	12	12	12	ZD40Y100	ISO705 H4-V12	PM60

Parting inserts

Type	Basic dimensions (mm)			Coating			
	Chip	HP	DP	YBC151	YBC251	YBC351	YBC451
ZP40Y100 H45	15	0.2	10	○	★	○	○
ZP40Y100 H45	25	0.2	14	○	★	○	○
ZP40Y100 H45	35	0.2	17	○	★	○	○
ZP40Y100 H45	45	0.2	20	○	★	○	○
ZP40Y100 H45	55	0.2	22	○	★	○	○
ZP40Y100 H45	65	0.2	24	○	★	○	○
ZP40Y100 H45	75	0.2	26	○	★	○	○
ZP40Y100 H45	85	0.2	28	○	★	○	○
ZP40Y100 H45	95	0.2	30	○	★	○	○
ZP40Y100 H45	105	0.2	32	○	★	○	○

1 Selection of tool holder type

2 Tool holder type, Size and applicable inserts

3 Insert type, Chip-breaker, Size and grade

Little squirrel series

Little squirrel series QC series shallow grooving inserts

Type	Basic dimensions (mm)		Coating	
	Chip	HP	YBC151	YBC251
QC□□□□/L	1.1-4.8	1.0-4.0	○	★
QC□□□□/L	1.1-4.8	1.0-4.0	○	★
QC□□□□/L	1.1-4.8	1.0-4.0	○	★
QC□□□□/L	1.1-4.8	1.0-4.0	○	★
QC□□□□/L	1.1-4.8	1.0-4.0	○	★

1 Selecting insert type

2 Insert type, Chip-breaker, Size and grade



Cemented carbide and cermet inserts

For finishing

						
	CNMG-XF	DNMG-XF	SNMG-XF	TNMG-XF	VNMG-XF	WNMG-XF
Cutting edge length	12	11,15	12	16	16	06,08
Page	A52	A60	A68	A78	A85	A88

							
DNEG-NGF	VNEG-NGF	CNMG-DF	CNMG-SF	CNMG-EF	CNMG-ADF	CNEG-NF	DNMG-DF
Cutting edge length	15	16	09,12	09,12	09,12	12	11,15
Page	A62	A86	A52	A52	A52	A53	A53

							
DNMG-SF	DNMG-EF	DNMG-ADF	DNEG-NF	SNMG-DF	SNMG-EF	SNMG-ADF	SNMG-SF
Cutting edge length	11,15	11,15	11,15	15	09,12	09,12,15	12
Page	A60	A61	A61	A61	A68	A68	A69

							
TNMG-DF	TNMG-SF	TNMG-EF	TNMG-ES	TNMG-ADF	VNMG-DF	VNMG-EF	VNMG-ADF
Cutting edge length	16,22	11,16,22	11,16,22	16	16	16	16
Page	A78	A78	A79	A79	A79	A85	A85

							
VNEG-NF	VNMG-SF	WNMG-DF	WNMG-SF	WNMG-EF	WNMG-ES	WNMG-ADF	WNEG-NF
Cutting edge length	16	16	06,08	06,08	06,08	08	06,08
Page	A85	A86	A88	A88	A89	A89	A89

For semi-finishing

						
	CNMG-XM	DNMG-XM	SNMG-XM	TNMG-XM	VNMG-XM	WNMG-XM
Cutting edge length	12,16,19	11,15	12,15,19	16,22	16	06,08
Page	A54	A63	A70	A80	A86	A90

							
CNMG-PM	CNMG-DM	CNMG-EM	CNMG-EG	CNMG-EH	CNMG-NM	DNMG-PM	DNMG-DM
Cutting edge length	09,12,16,19	09,12,16,19	12,16	12	12	12	11,15
Page	A53	A54	A55	A55	A55	A55	A62

							
DNMG-EM	DNMG-EG	DNMG-NM	SNMG-PM	SNMG-DM	SNMG-EM	SNMG-EG	SNMG-NM
Cutting edge length 11,15	11,15	15	09,12,15,19	09,12,15,19	12,15	12	12
Page A64	A64	A64	A70	A71	A71	A72	A72

							
TNMG-PM	TNMG-DM	TNMG-EM	TNMG-EG	TNMG-EH	VNMG-PM	VNMG-DM	VNMG-EM
Cutting edge length 11,16,22	11,16,22	16,22	16	16	16	16	16
Page A80	A81	A81	A81	A82	A86	A86	A87

							
VNMG-EG	VNMG-NM	WNMG-PM	WNMG-DM	WNMG-EM	WNMG-EG	WNMG-EH	WNMG-NM
Cutting edge length 16	16	06,08	06,08	06,08	08	08	08
Page A87	A87	A90	A91	A91	A91	A92	A92

						
	CNMG-SNR	DNMG-SNR	SNMG-SNR	TNMG-SNR	VNMG-SNR	WNMG-SNR
Cutting edge length	12,16,19	15	12	16	16	08
Page	A57	A66	A75	A83	A87	A92

							
CNMM-LR	DNMM-LR	SNMM-LR	TNMM-LR	CNMG-DR	CNMM-DR	CNMG-ER	CNMM-ER
Cutting edge length 12,16,19,25	15	12,15,19,25	16,22	12,16,19	12,16,19,25	12,16,19	25
Page A56	A65	A72	A82	A56	A57	A57	A57

							
DNMG-DR	DNMM-DR	DNMG-ER	DNMM-ER	SNMG-DR	SNMM-DR	SNMG-ER	SNMM-ER
Cutting edge length 15	15	15	15	12,15,19	12,15,19,25	12,15,19	25
Page A65	A65	A65	A66	A73	A74	A74	A75

			
TNMG-DR	TNMM-DR	TNMG-ER	WNMG-DR
Cutting edge length 16,22,27	16,22,27	16,22	06,08
Page A82	A83	A83	A92



Negative inserts

**For heavy
machining****CNMM-HPR****SNMM-HPR****CNMM-HDR****DNMM-HDR****SNMM-HDR****TNMM-HDR**Cutting edge
length

19,25

19,25

12,16,19

15

12,15,19,25

16,22,27

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**LNUX-RF****LNUX-RH**Cutting edge
length

19,30

19,30

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All round**CNMG-TC****CNMG****DNMG-TC****SNMG-TC****SNMG****TNMG-TC****VNMG-TC**Cutting edge
length

04,08,12,16

12,16,19

15

12

12,15,19,25

16,22

16

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**Without
chipbreaker****WNMG-TC****CNMA****DNMA****SNMA****TNMA****WNMA**Cutting edge
length

08

12,16,19

11,15

09,12,15,19

16,22,27

06,08

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**For extra
finishing****CCGT-SF****DCGT-SF****TCGT-SF****VCGT-SF****VBGT-SF****CPGT-SF****DPGT-SF**Cutting edge
length

06,09

07,11

06,09,11

11

11

06,09

07,11

Page

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**TBGH-L****TPGH-L****TPGT-SF**Cutting edge
length

06

09,11

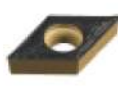
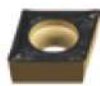
09,11

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**For
finishing****CCMT-XF****DCMT-XF****SCMT-XF****TCMT-XF****VBMT-XF****VCMT-XF**Cutting edge
length

06,09

07,11

09

09,11,16

11,16

11,16

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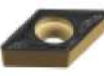
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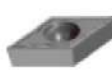
Positive inserts

							
VCMT-NGF	VBET-NGF	CCMT-HF	CCMT-EF	CCMT-AHF	DCMT-HF	DCMT-EF	DCMT-AHF
Cutting edge length	16	16	06,09,12	06,09,12	06,09,12	07,11	07,11
Page	A114	A118	A95	A96	A96	A100	A101

							
SCMT-HF	SCMT-EF	SCMT-AHF	TCMT-HF	TCMT-EF	TCMT-AHF	VCMT-NF	VCMT-AHF
Cutting edge length	09	09	09	06,09,11,16	09,11,16	11,16	16
Page	A106	A106	A106	A109	A109	A111	A114

			
VBMT-AHF	VBMT-HF	VBMT-EF	VBET-NF
Cutting edge length	16	11	11,16
Page	A118	A117	A117

For semi-finishing						
	CCMT-XM	DCMT-XM	SCMT-XM	TCMT-XM	VBMT-XM	VCMT-XM
	Cutting edge length	09,12	07,11	09,12	16	16
	Page	A96	A101	A107	A111	A118

							
CCMT-HM	CCMT-EM	CCMT-EG	DCMT-HM	DCMT-EM	SCMT-HM	SCMT-EM	TCMT-HM
Cutting edge length	06,09,12	06,09,12	06,09	07,11	07,11	09,12	09,12
Page	A97	A97	A97	A102	A102	A107	A107

			
TCMT-EM	TCMT-EG	VBMT-HM	VBMT-EM
Cutting edge length	09,11,16	11	16
Page	A111	A111	A119

For roughing						
	VBMT-SNR	CCMT-HR	DCMT-HR	SCMT-HR	TCMT-HR	VBMT-HR
	Cutting edge length	16	06,09,12	11	09,12	09,11,16,22
	Page	A119	A98	A102	A108	A112



Positive inserts

For Al machining



CCGX-LC

DCGX-LC

SCGX-LC

TCGX-LC

VCGX-LC

Cutting edge
length

06,09,12

07,11

09,12

09,11,16

11,16,22

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CCGX-LH

DCGX-LH

RCGX-LH

SCGX-LH

TCGX-LH

VCGX-LH

Cutting edge
length

06,09,12

07,11

08

09,12

09,11,16

11,16,22

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All round



CCMT-TC

RCM(G)T

RCMX

Cutting edge
length

06,09,12

08,10,12,16

08,10,12,16,20,25,32

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Parting and grooving inserts

Little squirrel
seriesQC series shallow
grooving inserts

QC□□R/L

QC□□R/L□□□R

Cutting edge
width

1.1~4.8

1.0~4.0

Page

A251-252

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G□MD-GM



G□MD-GM



ZP□D-MG



ZP□S-MG



ZT□D-MG



ZT□D-MM



ZT□S-MG

Cutting edge
width

2.5,3,4,5,6

3,4,5,6

1.5,2,2.5,3,4,5,6

2.5,3,4,5,6

2.5,3,4,5,6

1.5,2,2.5,3,4,5,6,8

5,6

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ZT□D-EG



ZT□D-EG



ZIMF-NM



ZIMF-SM



ZR□D-MG



ZR□D-NM



ZR□D-EG

Cutting edge
width

1-2.4 (tailor-made)

2.4-6.5 (tailor-made)

3,4,5,6

3,4,5,6

2.5,3,4,5,6

3,4,5,6

3,4,5,6

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ZIGQ-NM



ZIGQ-NF



ZR□D-LH



ZILD-LC

Cutting edge
width

3,4,5,6

3,4,5,6

6,8

8

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Supplemental
series

ZQMX-1E

Cutting edge
width

3,125,4,125,5,125,6,4,7,05

Page

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Threading inserts

Right hand type shown	ISO metric thread		General pitch thread		Whitworth thread	
						
	External thread	Internal thread	External thread	Internal thread	External thread	Internal thread
Pitch/ Number of pitch	0.5~6	0.5~6	0.5~5	0.5~5	8~19	8~19
Page	A294	A295	A296	A296	A297	A297

Right hand type shown	Unified thread		British taper pipe thread		American taper pipe thread	
						
	External thread	Internal thread	External thread	Internal thread	External thread	Internal thread
Pitch/ Number of pitch	8~24	8~24	11~28	11~28	8~27	8~27
Page	A298	A298	A299	A299	A300	A300

Right hand type shown	ISO metric thread		General pitch thread		Whitworth thread	
Threading inserts with PP chipbreaker						
	External thread	Internal thread	External thread	Internal thread	External thread	Internal thread
Pitch/ Number of pitch	1.0~3.0	1.0~3.0	0.5~5.0(5~48)	0.5~5.0(5~48)	11~19	11~19
Page	A301	A301	A302	A302	A303	A303

Right hand type shown	Unified thread		British taper pipe thread		American taper pipe thread	
						
	External thread	Internal thread	External thread	Internal thread	External thread	Internal thread
Pitch/ Number of pitch	12~16	12~16	11~19	11~19	11~19	11.5~18
Page	A304	A304	A305	A305	A306	A306

Right hand type shown	ISO metric thread		General pitch thread		Whitworth thread	
Thick threading insert						
	External thread	Internal thread	External thread	Internal thread	External thread	Internal thread
Pitch/ Number of pitch	0.5~6	0.5~6	0.5~5	0.5~5	8~16	8~16
Page	A311	A312	A313	A313	A314	A314

Right hand type shown	Unified thread		British taper pipe thread		American taper pipe thread	
						
	External thread	Internal thread	External thread	Internal thread	External thread	Internal thread
Pitch/ Number of pitch	8~24	8~24	11~28	11~28	8~27	8~27
Page	A315	A315	A316	A316	A317	A317

Tool holders for external turning

D-type clamping system

						
Approach angle 95°	93°	75°	91°	72°30'	93°	95°
Page A136	A137	A138	A139	A140	A140	A141

P-type clamping system

						
Approach angle 75°	95°	93°	62°30'	75°	45°	75°
Page A142	A143	A144	A145	A146	A147	A148

				
Approach angle 45°	91°	60°	90°	95°
Page A149	A150	A151	A152	A153

M-type clamping system

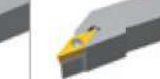
						
Approach angle 75°	95°	93°	62°30'	75°	45°	75°
Page A154	A155	A156	A157	A158	A159	A160

						
Approach angle 45°	90°	93°	93°	91°	72°30'	93°
Page A161	A162	A163	A164	A165	A166	A167


Approach angle 95°
Page A168



S-type clamping system

SCACR/L	SCLCR/L	SDACR/L	SDJCR/L	SDNCN	SVJBR/L	SVABR/L
						
Approach angle 90°	95°	90°	93°	62°30'	93°	90°
Page A169	A170	A171	A172	A173	A174	A175

SVVBN	SVVCN	SVJCR/L	SSBCR/L	SSDCN	SSKCR/L	SSSCR/L
						
Approach angle 72°30'	72°30'	93°	75°	45°	75°	45°
Page A176	A177	A178	A179	A180	A181	A182

STACR/L	STFCR/L	STGCR/L	SRDCN	SRGCR/L
				
Approach angle 90°	91°	91°		
Page A183	A184	A185	A186	A187

Turning tool holders for internal machining

P-type clamping system

					
Approach angle 95°	62°30'	93°	75°	90°	95°
Page A194	A195	A196	A197	A198	A199

S-type clamping system

						
Approach angle 95°	107°30'	93°	93°	75°	91°	107°30'
Page A200	A201	A202	A203	A204	A205	A206

						
Approach angle 93°	107°30'	93°	95°	107°30'	93°	93°
Page A207	A208	A209	A210	A211	A212	A213

	
Approach angle 90°	95°
Page A214	A215

Damping tool holders

					
Approach angle 95°	107°30'	93°	93°	107°30'	93°
Page A217	A218	A219	A220	A221	A221

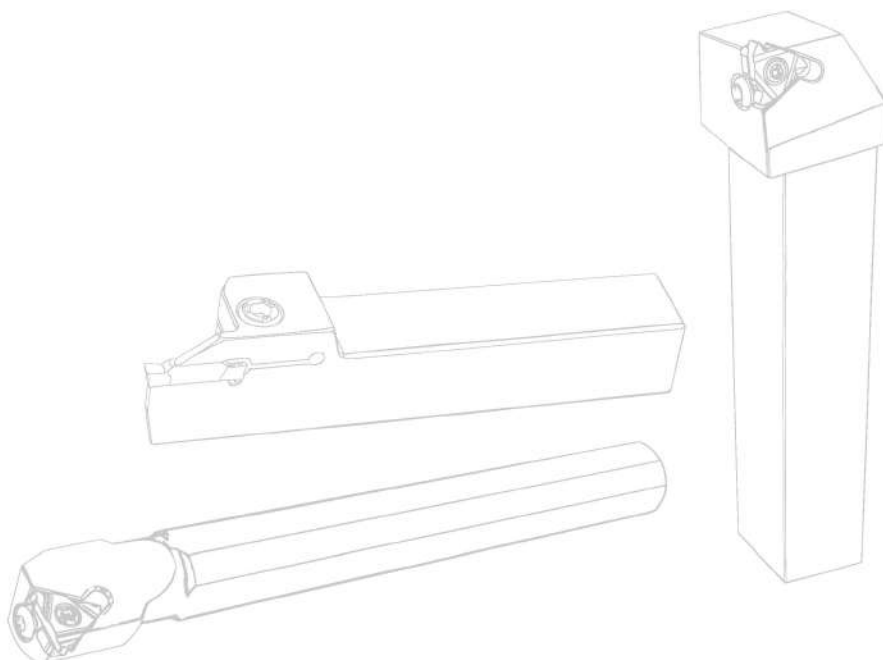


Parting and grooving tools

 QE□□R/L	 QECDR/L	 QX□DR/L	 QE□SR/L	 QE□S□□N	 QZS□	 QF□□R/L
Page A256-257	A257	A258	A258	A259	A259	A260-261
 QF□□RR/LL	 QF□DR/L	 C□□□-Q□DR/L	 C40X-Q□DR/L	 GED□□R/L	 GFD□□RR/LL	 GFD□□R/L
Page A262-265	A266-267	A268	A268	A269-271	A272-275	A276-277
 GID□□R/L	 QZQ□□R/L	 GQCR/L	 S□□□-QC□□□□R/L			
Page A278	A282	A280	A280			

Threading tools

 ZSER/L	 ZSIR/L	 SWR/L	 SNR/L
Page A308	A309	A319	A320





General turning inserts overview

Negative inserts with hole

Application	Chipbreaker	Precision	Recommended cutting parameters	Chipbreaker profile	Feature / Shape of insert
For finishing	SF	M			Recommended chipbreaker for finishing of P-type mild steel Double-sided chipbreaker with M-level tolerance has outstanding performance in finishing, achieving good surface quality.
	XF				Recommended chipbreaker for finishing of P-type materials The curved edge angle ensures the strength of the cutting edge, effectively reduces the cutting resistance, and the special chipbreaker design can ensure the chip control performance in the finishing range.
	DF	M			Recommended chipbreaker for finishing of P-type materials Double-sided chipbreaker with M-level tolerance has sharp edges, which can effectively cut off stainless steel and avoid adhering and surface hardening, achieving high surface quality.
	EF				Recommended chipbreaker for finishing of M-type materials Double-sided chipbreaker with M-level tolerance can prevent wear and hardening to achieve high machining precision and good surface quality.
	ES	M			Brand new recommended chipbreaker for M-type material finishing Sharp large rake angle design reduces cutting resistance with a good machining surface quality. The unique chipbreaker structure realizes good chip control and reduces cutting heat.
	ADF				Recommended chipbreaker for M-type material universal finishing G-level tolerance. High dimensional and repeatable positioning accuracy can be obtained. Special design of the rake face structure ensures the strength of the insert meanwhile greatly reduces the cutting resistance. Advanced technology for edge treatment process and coating post-treatment ensure machining parts with excellent surface finish.
	NF	E			Recommended chipbreaker for finishing of S-type materials Double-sided chipbreaker with E-level tolerance can prevent wear and hardening to achieve high machining precision and good surface quality.

Negative inserts with hole

Application	Chipbreaker	Precision	Recommended cutting parameters	Chipbreaker profile	Feature / Shape of insert
For finishing	NGF	E			Recommended chipbreaker for finishing of S-materials E-level double side chipbreaker with excellent sharp type edge. High positioning accuracy, light cutting force, which is recommended chip breaker for S-type material general finishing.
For semi-finishing	XM	M			Recommended chipbreaker for semi-finishing of P-type materials Special cutting edge structure, taking into account cutting sharpness and insert strength, the newly designed chipbreaker, to ensure the chip control performance in the semi-finishing range.
	DM				Recommended chipbreaker for semi-finishing of P-type materials Double-sided chipbreaker with M-level tolerance produces small cutting forces and has large chip breaking range, which ensures good performance for machining highly adhesive alloy steel.
	PM				Recommended chipbreaker for semi-finishing of P-type materials Double-sided chipbreaker with M-level tolerance has higher strength of cutting edge than chipbreaker DM. It is suitable for semi-finishing under unstable working conditions as well as machining cast iron with small cutting forces.
	EH				Brand new recommended chipbreaker for M-type material semi-finishing M-level tolerance. Double positive rake angle take into account the sharpness and strength of the tool tip. Suitable for efficient machining of stainless steel in intermittent working conditions.
	NM				Recommended chipbreaker for semi-finishing of S-type materials Double-sided chipbreaker with M-level tolerance keeps high precision after inserts are turned, with good capability to prevent wear and hardening to achieve higher machining efficiency than chipbreaker NF.
	EM				Recommended chipbreaker for semi-finishing of M-type materials Double-sided chipbreaker with M-level tolerance can solve the processing problems such as chip breaking and adhering of stainless steel, achieving higher machining efficiency than chipbreaker EF.



Negative inserts with hole

Application	Chipbreaker	Precision	Recommended cutting parameters	Chipbreaker profile	Feature / Shape of insert
For semi-finishing	EG	M			Recommended chipbreaker for M-type material universal machining M-level tolerance. Reasonable chipbreaker design realizes good chip control. Sharp rake angle effectively suppresses burr generation.
	All round				From semi-finishing to roughing of P-type, M-type, K-type materials Double-sided chipbreaker with M-level tolerance has good cutting edge strength and wide application.
Light-load roughing	DR Double-side	M			Recommended chipbreaker for light roughing of P-type and K-type materials Double-sided chipbreaker with M-level tolerance is the first choice for light roughing, can achieve high evacuation rate and efficiency of cutting edge.
	LR Single-side				Recommended chipbreaker for light-load roughing of P-type materials Single-sided general chipbreaker with M-level tolerance, has wide chip breaking range and sharp cutting edge is designed with inclined angle, which enables it to cut lightly and easily and control the chip flow direction. Chip-lead-stages can reduce the contact area with chips, so that heat can easily be dissipated.
For roughing	ER Single/Double side	M			Recommended chipbreaker for roughing of M-type materials Single / double-sided chipbreaker with M-level tolerance has good capacity of impact-resistance. It is designed to achieve balance between security and sharpness of the cutting edge, and it can achieve high efficiency by preventing the problems of adhering and high cutting heat when roughing stainless steel.
	DR Single-side				
	DR Single-side	M			Recommended chipbreaker for roughing of P-type materials Single-sided chipbreaker with M-level tolerance has high security of cutting edge, which can achieve high feed rate and low cutting forces at great cutting depth and high feed rate.

Negative inserts with hole

Application	Chipbreaker	Precision	Recommended cutting parameters	Chipbreaker profile	Feature / Shape of insert
For roughing	SNR	M			Recommended chipbreaker for S-type material high efficiency roughing M-level double-sided chipbreaker perfectly combines sharpness and strength of the cutting edge, with small cutting resistance and high edge strength can effectively reduce groove wear. SNR is recommended chipbreaker for high depth roughing of S- materials.
	HDR Single-side				Recommended chipbreaker for heavy load machining of P-type materials M level single-sided chipbreaker with strengthen cutting edges, high safety and excellent plastic deformation resistance under high metal removal rate.
Heavy-load machining	HPR Single-side	M			Recommended chipbreaker for heavy-load machining of P-type materials Single-sided chipbreaker with M-level tolerance, strong cutting edge. Multi-stages chipbreaker ensures the flowing of chip and heat dissipation of insert. It is suitable for machining under unstable and relatively bad working condition, especially for external roughing of workpiece with a rough oxidized surfaces.
	TC				Universal chipbreaker for K-type material machining M-level tolerance. High edge strength, excellent impact resistance and stable performance, which is suitable for cast iron material finishing to rough machining occasions.
Cast iron machining	Without chipbreaker	M			For cast iron machining Double-sided chipbreaker with M-level tolerance has high cutting edge strength. It can overcome inferior factors such as interruption and vibration, etc. when machining cast iron.
	Without chipbreaker				

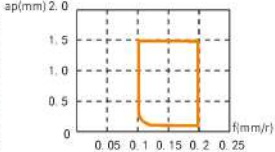
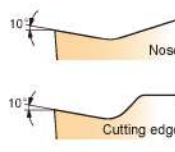
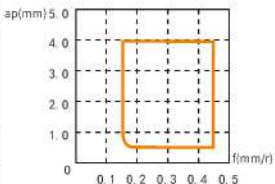
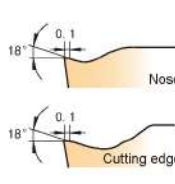
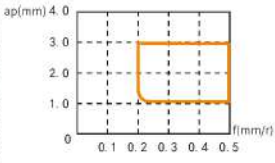
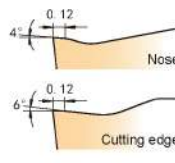
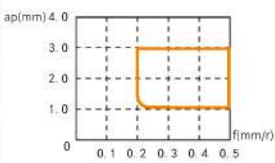
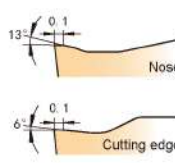
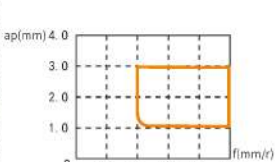
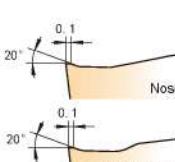
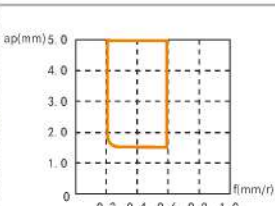
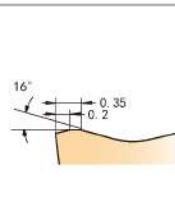
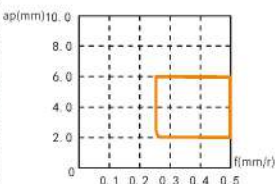
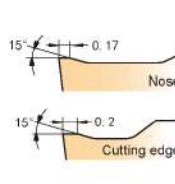


General turning inserts overview

Positive inserts with hole

Application	Chipbreaker	Precision	Recommended cutting parameters	Chipbreaker profile	Feature / Shape of insert
For extra finishing	R/L	G			Recommended chipbreaker for precise boring inserts G-level tolerance, sharp cutting edge and small nose radius, it can effectively reduce the vibration in machining and is suitable for boring and external turning.
For extra finishing	SF	G			First choice for finishing with high requirements on chipbreaker G-level tolerance, it is the first choice for precise finishing due to its excellent performance on chip breaking.
For finishing	XF	M			Recommended chipbreaker for finishing of P-type materials The curved edge angle ensures the strength of the cutting edge, effectively reduces the cutting resistance, and the special chip breaking groove design can ensure the chip control performance in the finishing range.
	HF	M			Chipbreaker for finishing with wide application M-level tolerance, it is suitable for internal and external finishing of various materials such as steel and cast iron.
	EF	M			Recommended chipbreaker for finishing of M-type materials M-level tolerance, it has sharp cutting edges and is suitable for cutting adhesive materials such as stainless steel, soft steel, etc.
For finishing	AHF	G			Recommended chipbreaker for M-type material universal finishing G-level tolerance. High dimensional and repetitive positioning accuracy can be obtained. Unique vibration-damping chipbreaker design realizes good surface quality even when machining long and thin shaft parts.
For finishing	NF	E G			Recommended chipbreaker for finishing S-type materials E and G-level tolerance and sharp cutting edges, it is suitable for internal and external finishing of high-temperature alloy materials.

Positive inserts with hole

Application	Chipbreaker	Precision	Recommended cutting parameters	Chipbreaker profile	Feature / Shape of insert
For finishing	NGF	E G			Recommended chipbreaker for S-type material general finishing E, G-level tolerance, for inner hole finishing of S-type materials. 
	XM				Recommended chipbreaker for semi-finishing of P-type materials Special cutting edge structure, taking into account cutting sharpness and insert strength, the newly designed chipbreaker, to ensure the chip control performance in the semi-finishing range. 
For semi-finishing	HM	M			Chipbreaker for semi-finishing with wide application M-level tolerance, it is suitable for internal and external semi-finishing of materials like steel, cast iron, etc. 
	EM				Recommended chipbreaker for semi-finishing of M-Type materials M-level tolerance, it has higher hardness of cutting edge than EF and can achieve higher efficiency. 
	EG				Recommended chipbreaker for M-type material universal machining M-level tolerance. Reasonable chipbreaker design realizes good chip control. Sharp rake angle effectively suppresses burr generation. 
	All round				Recommended chipbreaker for semi-finishing of M-type materials M-level tolerance, it is suitable for profile machining materials like steel, cast iron, etc. 
	HR				General chipbreaker for roughing M-level tolerance, it is suitable for both internal and external roughing of materials such as steel, stainless steel, cast iron, etc. 



Positive inserts with hole

Application	Chipbreaker	Precision	Recommended cutting parameters	Chipbreaker profile	Feature / Shape of insert
For roughing	TC	M			Universal chipbreaker for K-type material machining M-level tolerance. High edge strength, excellent impact resistance and stable performance, which is suitable for cast iron material finishing to rough machining occasions.
	Special chipbreaker				Recommended chipbreaker for heavy machining of P-type materials Single-sided with M-level tolerance, it has good cutting edge strength with high security. It is the first choice for profile roughing.
	SNR				Recommended chipbreaker for S-type material high efficiency roughing M-level tolerance, for inner hole roughing of S materials.
For AI machining	LC	G			Chipbreaker for machining of AI alloy G-level tolerance, large rake angle and clearance angle make the cutting edge sharper, ensuring easy and fast cutting while remaining effective chip breaking.
	LH				Special chipbreaker for machining of AI alloy G-level tolerance, large rake angle and polishing treatment on surface, it can effectively prevent built-up edge and achieve high workpiece surface quality while maintaining long life.



Cutting test for chip breaking range of general turning inserts

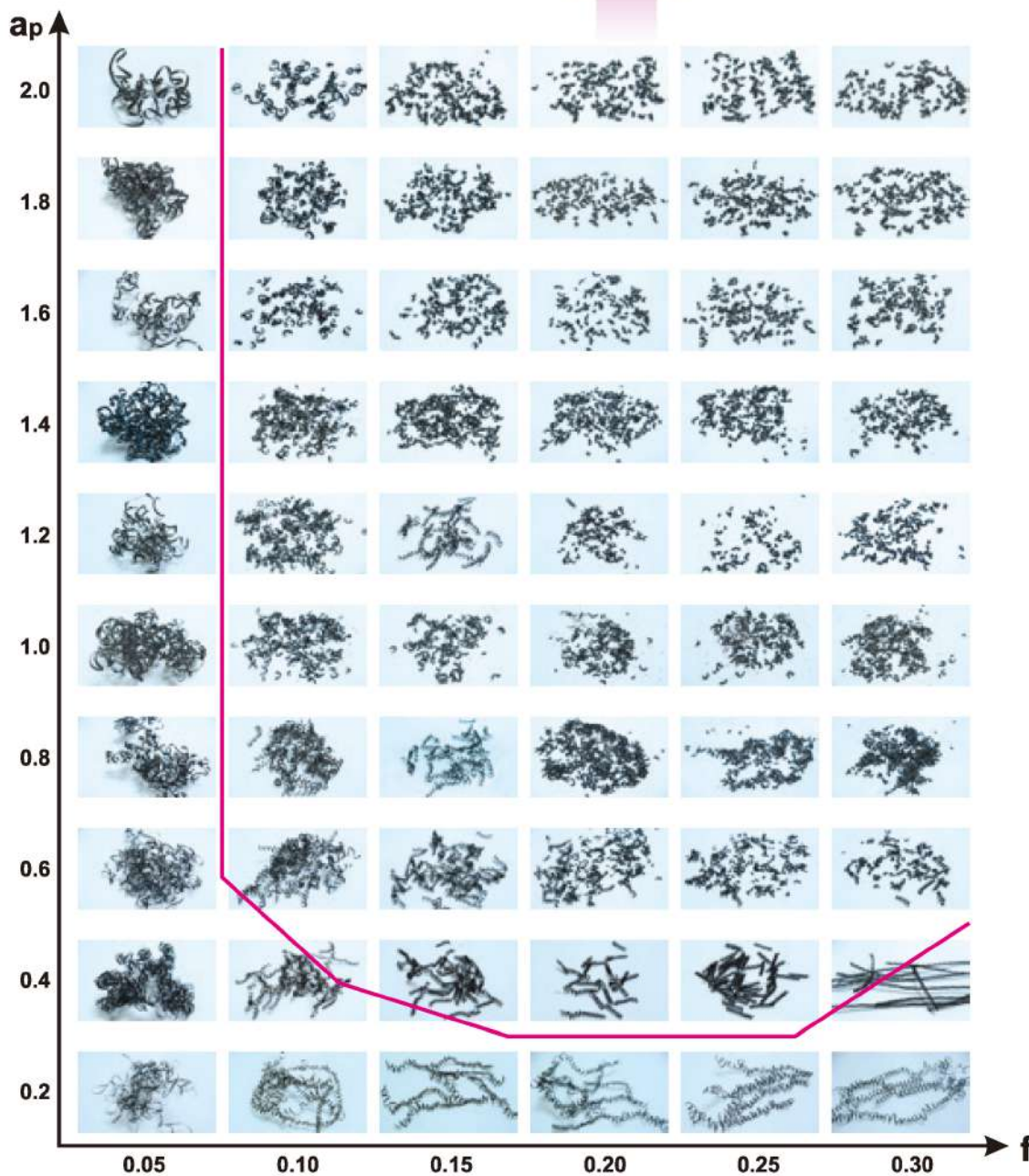
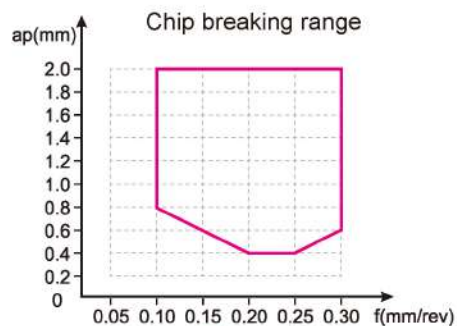
Case

Insert: CNMG120408-DF

Toolholder: PCLNL2525M12

Workpiece material: 45# steel

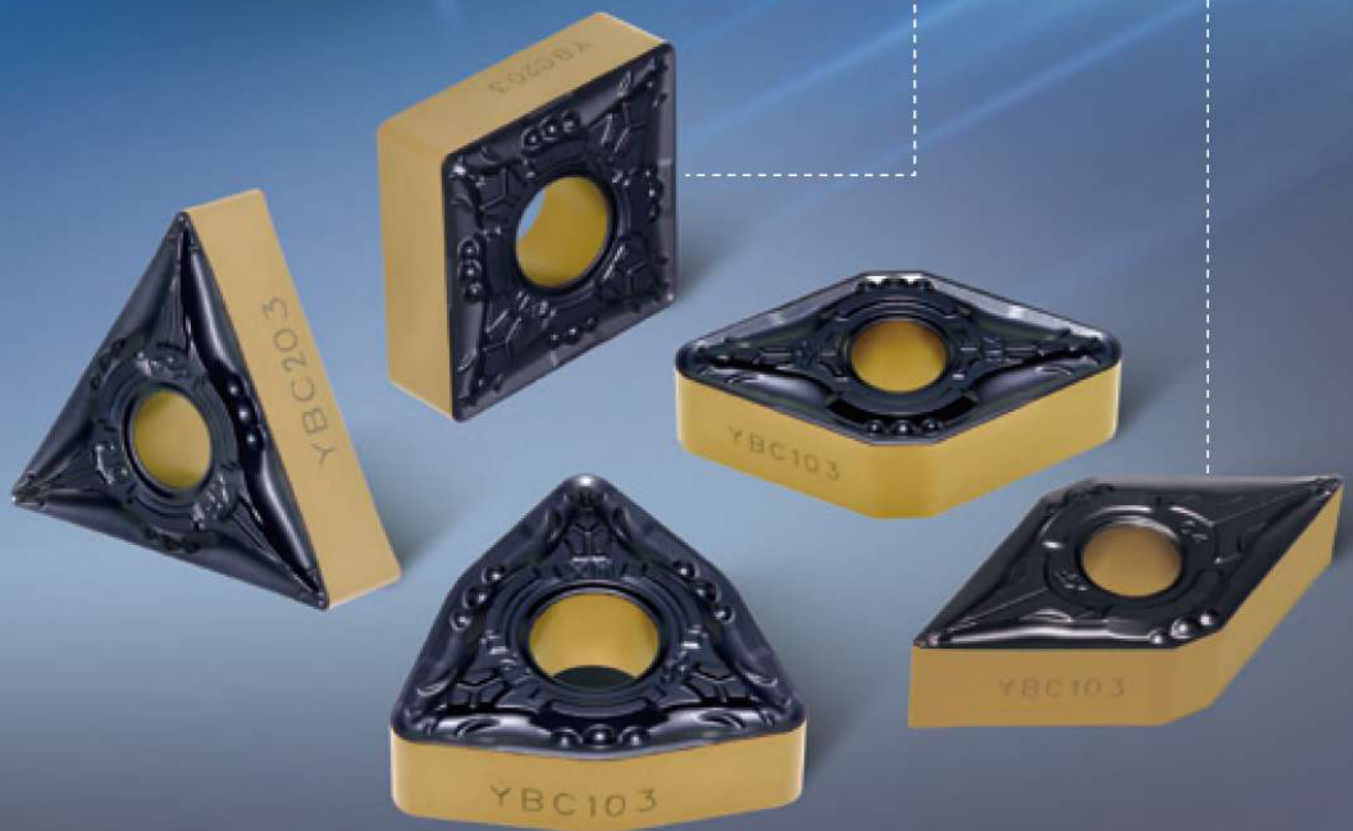
Cutting speed: 200m/min

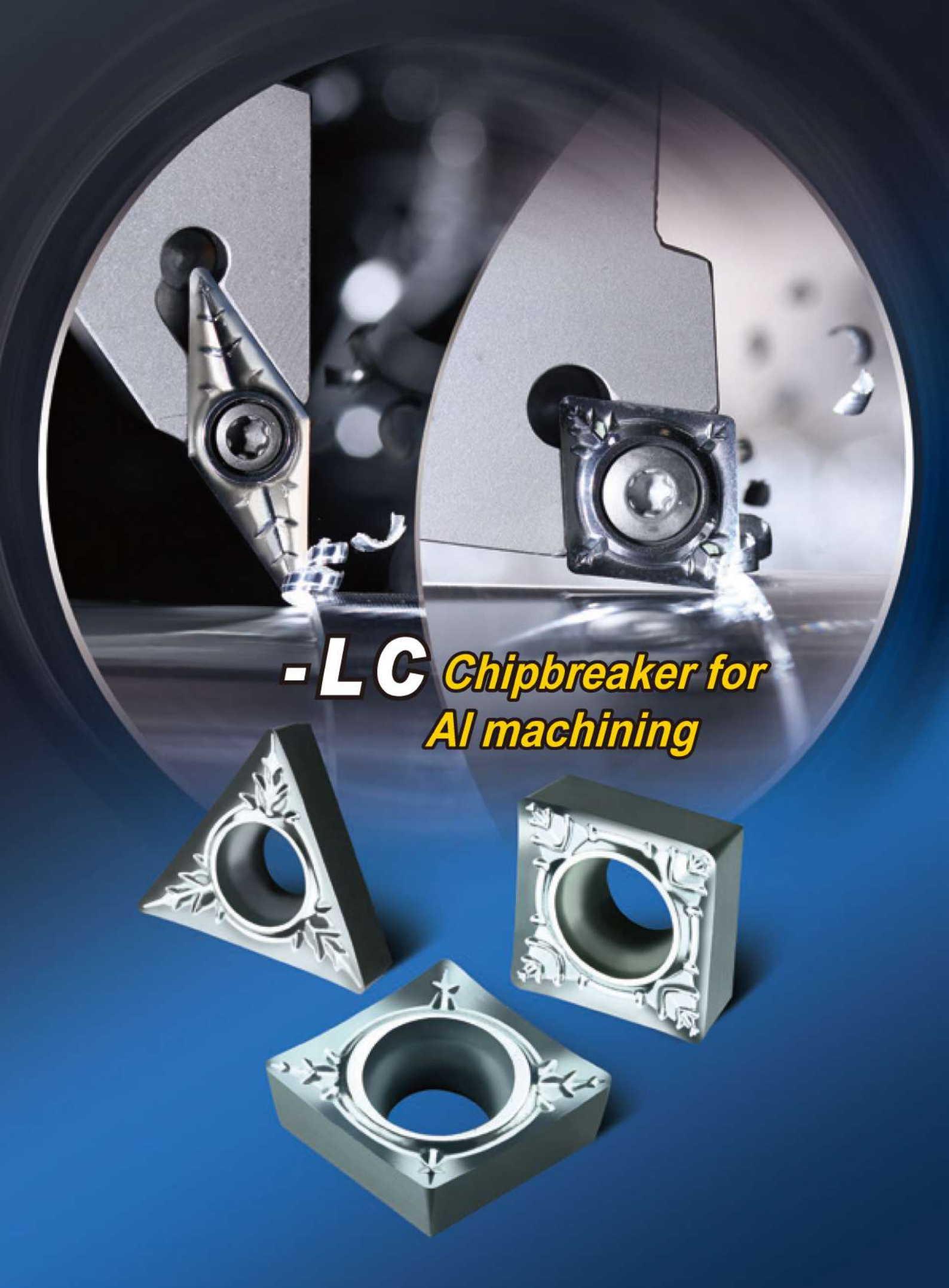


**New turning
grade for P-type
materials**

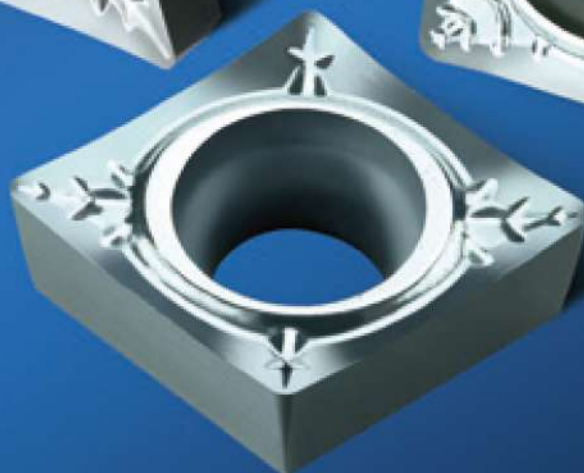
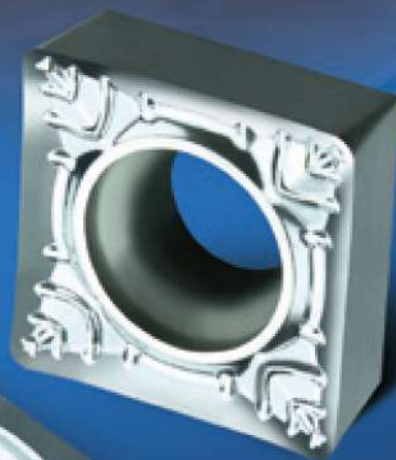
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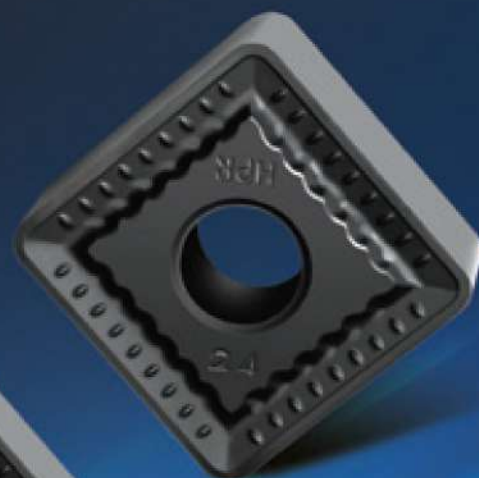
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-LC *Chipbreaker for
Al machining*

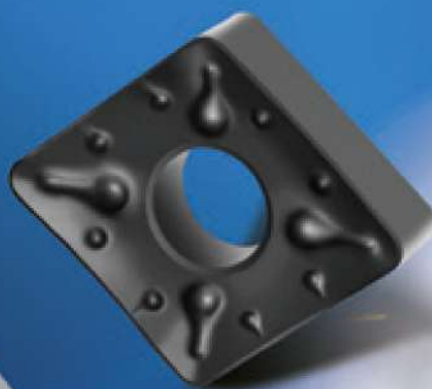




-HPR

**New generation of
roughing chipbreaker**

-LR



A collection of YBM215 tool bits, including square, triangular, and hexagonal shapes, some with central holes. They are arranged on a blue background with a metallic surface in the upper left.

YBM215

Outstanding wear resistance, extends the tool life
achieves high efficient processing

**Grade for stainless
steel machining**



YBM153

Best choice for cutting stainless steel
with high speed under good working condition



ISO	General turning						Threading	Parting and grooving		
Code	Coating		Cermet	Coated cermet	Ceramic	Cemented carbide	Coating	Coating		Cemented carbide
	CVD	PVD					PVD	CVD	PVD	
P Steel	01									
	10	YBC152 YBC103								
	20	YBC252 YBC203	YBG102	YNG151			YBG202 YBG203		YBG205 YBG302	
	30									
	40	YBC352								
M Stainless steel	01									
	10	YBM153 YBM251		YNG151			YBG202 YBG203		YBG205 YBG302	
	20		YBG202 YBM215 YBG205		YNG151C					
	30	YBM253								
	40									
K Cast iron	01									
	10	YBD052 YBD102 YBD152		YNG151		CN3100	YBG202 YBG203		YBG205 YBG302	YD201
	20									
	30									
N Non ferrous metal	01									
	10									
	20					YD101	YBG202 YBG203			YD101
	30									
S Heat resistant alloy & Ti alloy	01									
	10		YBS103 YBG102 YBG105		CN3100	YD101	YBG202 YBG203		YBS103 YBG102 YBG105 YBG302 YBG212 YBG202	YD101
	20		YBG212 YBG202							
	30									
H Super hard material	01									
	10				CN3100		YBG202 YBG203			
	20									
	30									



How to select general turning inserts

How to select general turning inserts

Turning inserts list

- Turning inserts listed according to shape
- Sequence of listed inserts:
 - Negative inserts (with hole – without hole)
 - Positive inserts (with hole – without hole)
- Sequence of listed chipbreaker
 - For finishing – For semi-finishing – For roughing – For heavy cutting – Without chipbreaker – Through chipbreaker

Selecting grade according to workpiece material and working condition

Prior to select grade for insert according to working condition that is suitable for workpiece material

😊 Good working condition: machine works well and stably. There are high requirements for dimensional precision of components and quality surface.

😐 Normal working condition: machine works normally. There are certain requirements for dimensional precision of components and surface quality.

😞 Bad working condition: machine works with bad stability. There are high requirements for metal evacuation rate.

Main category of products

Positive or negative inserts

Shape and dimensions

L: Cutting edge length
IC: Diameter of inscribed circle
S: Thickness
D1: Hole diameter
RE: Nose radius

Type

Grade

Size

Stock

Illustration of stock

CN (Negative Inserts)

Good working condition Normal working condition Bad working condition

Workpiece material	P	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K	M	K
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Insert code key: A48-A49
Grade selection reference: A21-A38-A45
Chipbreaker selection reference: A24-A37
Recommended cutting parameters: A22-A24

Reference page of tool holders

Application of inserts

Shape

Insert chipbreaker
Chipbreaker code

Recommended cutting parameters
Chipbreaker selection reference
Grade selection reference
Insert code key



TURNING



General turning inserts

General turning inserts overview • A24-A30

Application instruction for general turning inserts • A31-A47

General turning inserts • A48-A122

General turning inserts code key • A48-A49

Metric-inch comparison table for general turning inserts • A50-A51

Cemented carbide and cermet inserts • A52-A122

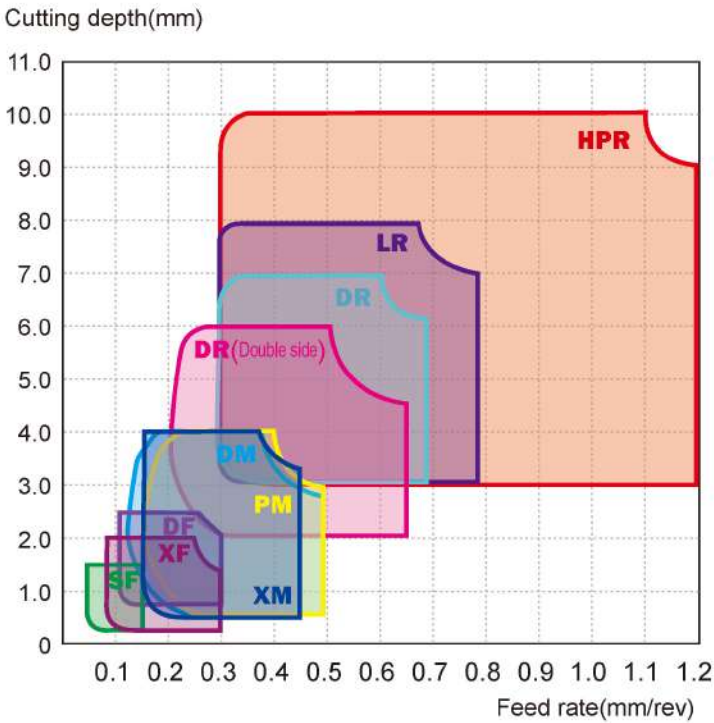
Negative inserts • A52-A94

Positive inserts • A95-A122

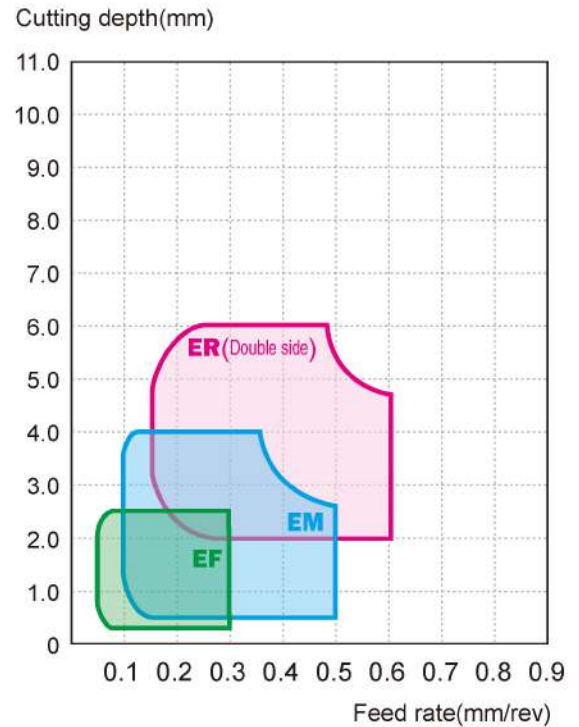


Chip breaking range reference for general turning inserts

Negative inserts

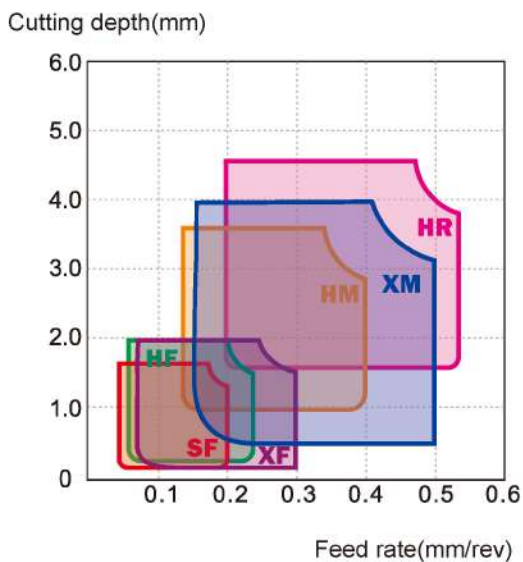


▶ Workpiece material: 45# steel

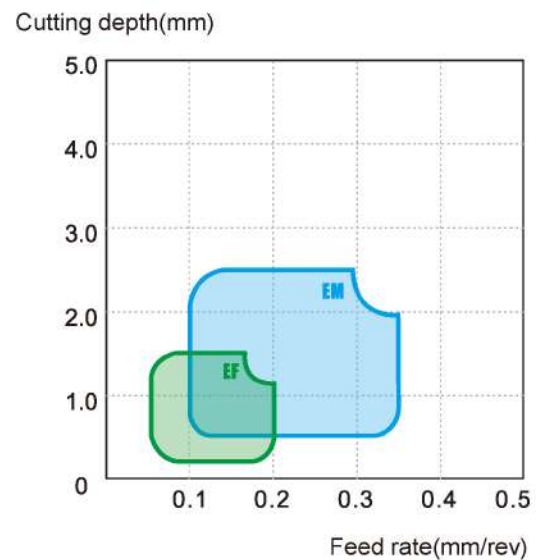


▶ Workpiece material: stainless steel (1Cr18Ni9Ti)

Positive inserts



▶ Workpiece material: 45# steel



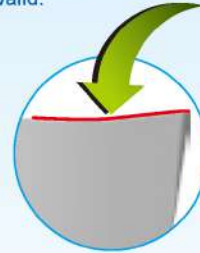
▶ Workpiece material: stainless steel (1Cr18Ni9Ti)

-LC

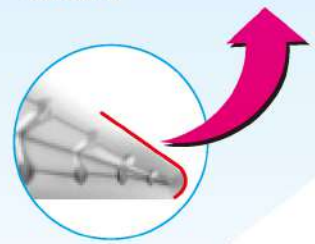
chipbreaker for aluminum

- LC inserts are designed with a special chipbreaker. Large rake angle and clearance angle make the cutting edge sharper, ensuring easier cutting while remaining effective chip breaking.
- Achieved the mirror rake face after special treatment. Reduced the friction resistance, and stick free. Accordingly, make the chip removal fluently and improve the surface quality and tool life.
- The G-class tolerance of insert, higher Repeated Position Accuracy, at the same time, it can effectively avoid the vibration during the machining process.

Optimized inclined angel makes controlling the chipping flow direction valid.

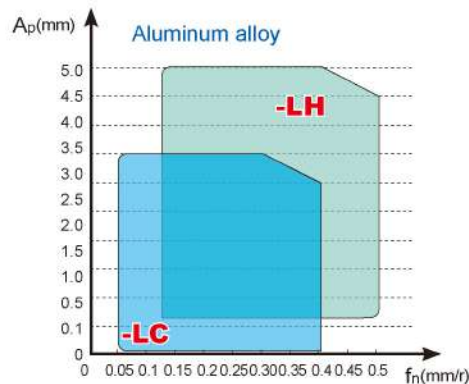
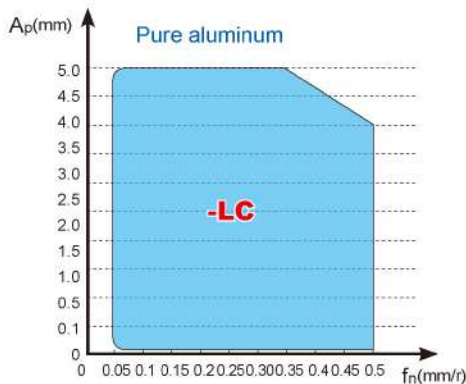


Smooth connection of insert nose and cutting edge makes rake face smoother.



-LC and -LH chipbreaker characteristics and machining range

-LC chipbreaker can be used in machining of pure Al, while -LH chipbreaker can not.
-LC chipbreaker expand the chip breaking range of Al alloy machining.

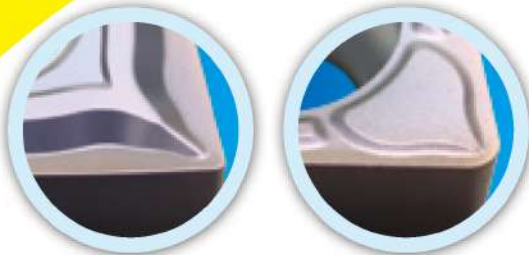


Workpiece material: Pure aluminum

Cutting parameters	Vc=350m/min Ap=0.2mm F=0.2mm/r	
Chips		
Surface quality		
-LC chipbreaker Similar products from overseas manufacturers -LH chipbreaker is more suitable for machining aluminum alloy in condition of large cutting depth and high feed rate. -LC chipbreaker is more suitable for machining aluminum alloy in condition of small cutting depth and low feed rate. -LC chipbreaker can be used in machining pure aluminum.		

-EF -EM -ER

Specially designed for machining intensively adhesive and high-plasticity materials such as stainless steel, etc



-EF

Rake angle and inclined angle are specially designed for intensively adhesive stainless steel and high-plasticity materials which are hard to be machined. Sharp cutting edge enables it to cut lightly and easily and achieve good surface quality by well controlling chip breaking. It is especially suitable for finishing these kinds of materials.



-EM

Inserts meet the requirements of machining intensively adhesive materials. Impact resistance of cutting edge is improved in addition to sharpness, which makes it suitable for semi-finishing and intermittent machining of adhesive materials such as austenitic stainless steel, etc.

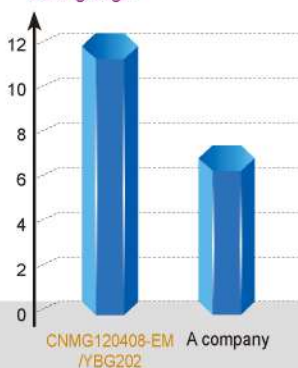


-ER

Specially designed double rake angle with wide land achieves balance between edge security and sharpness, and effectively reduces cutting resistance and wear on groove.



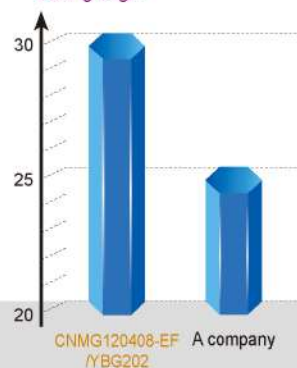
Number of machined parts / Cutting edge



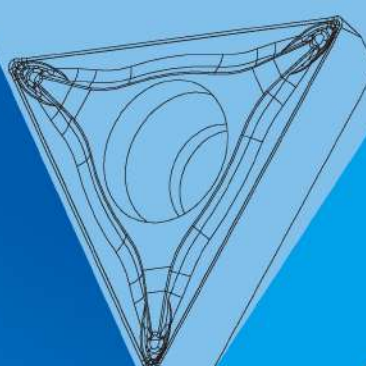
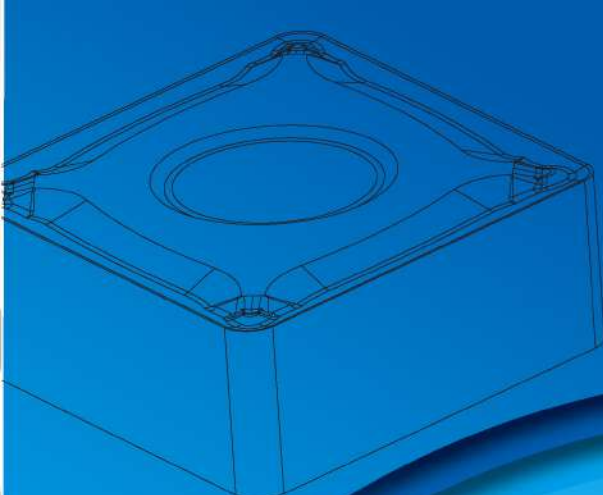
Machining external of valve

Machining end surface of valve (intermittent machining)
Workpiece diameter: 135mm
Rotating speed: 350rpm
Feed rate: 0.25mm/r
Cutting depth: 1.5mm

Number of machined parts / Cutting edge



Machining external of valve
Workpiece diameter: 89mm
Rotating speed: 635rpm
Feed rate: 0.15mm/r
Cutting depth: 1.0mm



-SF

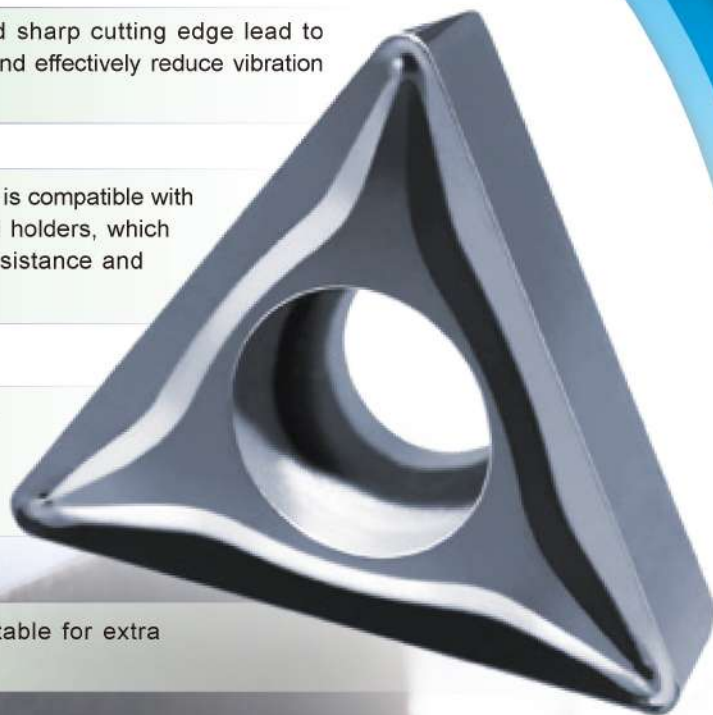
Chipbreaker for finishing

- Unique nose design and sharp cutting edge lead to small cutting resistance and effectively reduce vibration of the tool holder.

- With high re-positioning precision, the insert is compatible with specially developed cemented carbide tool holders, which can increase the capability of vibration resistance and improve machining quality.

- Special treatment on insert's surface can reduce the possibility of chips adhering to the rake face of insert. Good performance of chip breaking and chip flowing ensures improved surface quality of workpiece.

- By adopting excellent grade, it is suitable for extra finishing of various materials.



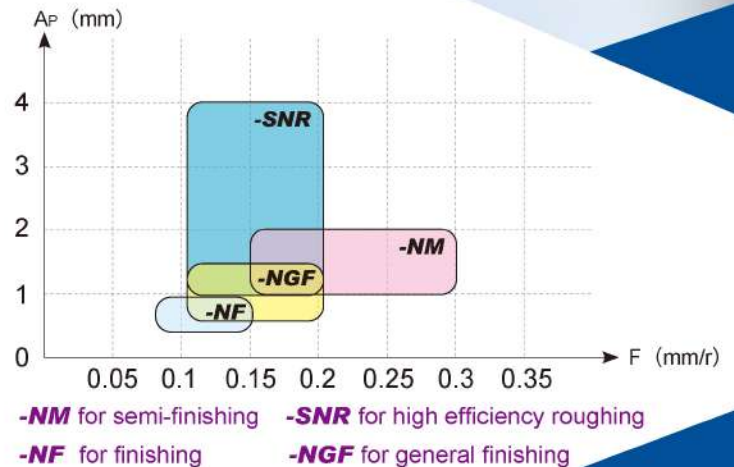
S- Ni-based Superalloy Machining

Difficulties Overcome

Features of Ni-based superalloy machining

- High cutting resistance (containing a large amount of alloying elements, severe hardening, great plastic deformation;
- High cutting temperature;
- Severe wear of inserts.

Chipbreaker for machining of Ni-based superalloy should have tough and sharp insert nose, smooth rake face and proper inclination angle.



-SNR Chipbreaker for roughing with large depth of cut

- Positive rake angle design, sharp cutting edge, low cutting resistance, effectively reducing groove wear;
- Cutting edge with variable rake angles increase cutting edge strength at large depths of cut. Edge strength increases as the depth of cut increases;
- Large slot width combined with unique edge rib design not only provides excellent chip breaking performance but also can effectively improve edge strength.



-NGF Chipbreaker for General Finishing

- Proper inclination angle design, sharp cutting edge, small cutting resistance;
- E-level tolerance of insert, high clamping accuracy, proper chipbreaker width, good chip breaking performance, excellent surface quality;
- Special edge treatment, high wear resistance.



-NFINM Chipbreaker for General Finishing

- The chipbreaker have smooth surface and smooth chip guide.
- The cutting edge is specially treated, strong and sharp, with high wear resistance.
- -NF chipbreaker large front angle design, combined with edge inclination and special edge design, sharp cutting edge, small cutting force.
- -NM chipbreaker double front angle design, combined with special chip cutting groove design, high cutting strength, good chip breaking.



BLACK DIAMOND INSERTS

**Innovation of machining techniques
for stainless steel turning**

YBM

YBM153



Best choice for roughing of stainless steel with high-speed under good working condition

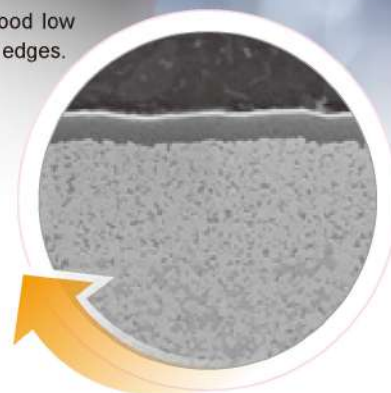
Application fields: YBM153 is suitable for finishing and semi-finishing of stainless steel with high cutting efficiency under stable working condition. Such as medium-size fluid valve components in petrochemical industry, flange and other parts in auto pipeline, valve and valve body in auto engine systems, ship mechanical parts, aviation hydraulic parts, adapting pieces in IT and semiconductor industry, medium and long-axis in food processing machinery, construction machinery and general machinery.

Coating

- ✓ CVD coating with advanced ultra-fine grain coating technology, greatly improves wear resistance of inserts.
- ✓ Thanks to special treatment on transition layer, multi-layer coating are combined firmly.
- ✓ The exceptionally smooth coating surface and good low friction ability can reduce the occurrence of built-up edges.

Substrate

- ✓ Added with resist high temperature rare element, inserts shows a good capability against plastic deformation and good capability of Red Hardness.
- ✓ Unique manufacturing technology improves high temperature toughness and wear resistance of substrate.



YBM253



Ideal grade for turning of stainless steel with high cutting depth and high feed rate under bad working condition

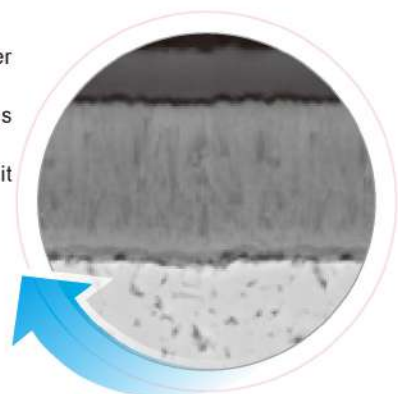
Coating

- ✓ Ultra-fine grain coating technology provides better wear resistance and toughness;
- ✓ Improved remain internal stress design ensures good toughness and anti-cracking performance;
- ✓ Polishing treatment on coating surface makes it suitable for cutting adhesive materials.

Substrate

- ✓ With gradient carbide substrate insert has better impact resistance and cutting edge strength.

Application fields: YBM253 grade is suitable for roughing of heavy stainless steel parts with high cutting depth and high feed rate under the condition with great impact.



Coated Cemented Carbide CVD

Second generation of

YBC

BLACK DIAMOND INSERTS

Achieving both higher cutting speed and longer tool life

YBC152

Thick TiCN and thick Al₂O₃ coatings improve the impact toughness and abrasion resistance, which makes it suitable for finishing and semi-finishing of steel at high speed. Cutting speed can increase by more than 25%, while the tool life can increase by more than 30% at the same cutting speed.

YBC252

Comprising of thick TiCN and thick Al₂O₃ coatings, the grade has high capability against plastic deformation and good hardness of cutting edge. It is preferred grade for machining of steel from finishing to roughing. Under the same cutting conditions, the cutting speed can be increased by more than 25%, while the tool life can be 30% longer under the same cutting speed.

YBC352

Thickness TiCN and Al₂O₃ coating, with strongest toughness and plastic deformation resistance, the ideal grade for high efficient steel rough machining under the bad condition.

Test comparison of inserts abrasion

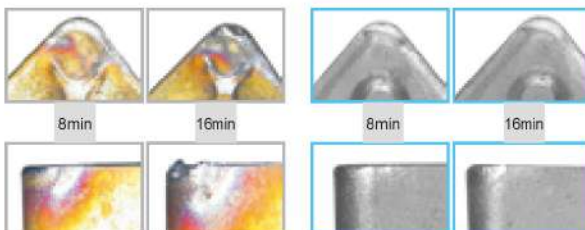
Workpiece material : 45#steel

Inserts: CNMG120408-DM

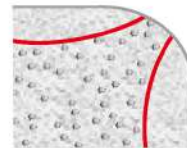
Cutting parameters: Vc=400m/min ap=1mm fn=0.2mm/r

Grade from other company

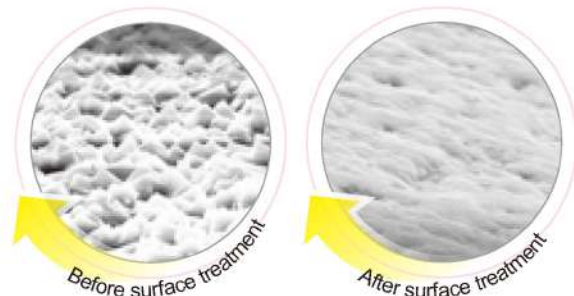
YBC152



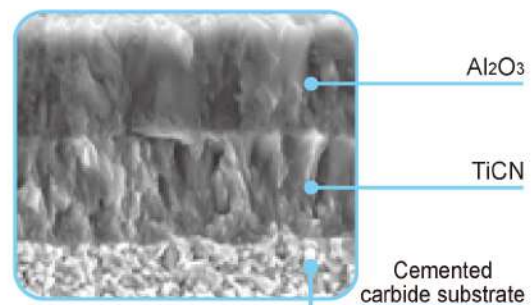
- Perfect unification of toughness and anti-plastic deformation. Specially designed cutting edge with "skeleton" realizes perfect unification of toughness and anti-plastic deformation.



- Roughness of insert surface is improved after special treatment on surface, which effectively reduces cutting forces, prevents workpiece adhering to surface of inserts and improves operation stability of inserts.



- The perfect combination of fibrous TiCN and fine grain Al₂O₃ obviously improves abrasion resistance and anti-breakage of inserts.



Coated Cemented Carbide CVD

YBD052

CVD coated grade, which is characterized by super fine grain and smooth surface, is the combination of hard substrate and coating (extra thick Al_2O_3 + thick TiCN). The grade is optimized for best wear resistance when machining gray cast iron at high speed under dry condition.

YBD102

CVD coated grade, which is the combination of hard substrate and coating (thick Al_2O_3 + thick TiCN), shows excellent wear resistance and impact resistance when machining nodular cast iron at high speed.

YBD152

CVD coated grade, which is the combination of hard substrate and coating (medium thick Al_2O_3 + thick TiCN), has good flaking resistance. It is suitable for turning of cast iron at high speed, and light intermittent cutting can be supported even at moderate speed. It is also suitable for milling of cast iron.

BLACK DIAMOND INSERTS YBD

First choice for high-efficiency and high-speed machining of cast iron



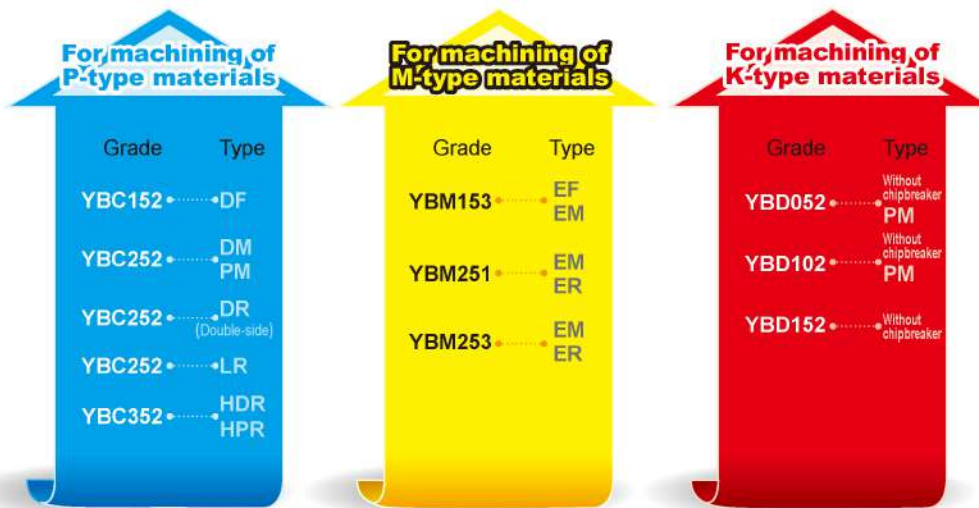
Layer of fine grain with compact surface

- The combination of thick coating and substrate with good hardness and impact resistance gives the inserts excellent impact resistance and stability under high temperature, and improves wear resistance of inserts. Inserts also satisfy the requirements of high speed and high feed rate when machining cast iron.
- The appearance of shining full black is easily identified.

Significant results

- Working efficiency has been improved. Both the coating and the substrate are suitable for machining cast iron at high speed and high feed rate. **Cutting speed can be increased by 30% to 40%.**
- Cost is reduced as tool life **is increased by 40%-50%.**
- High machining stability.

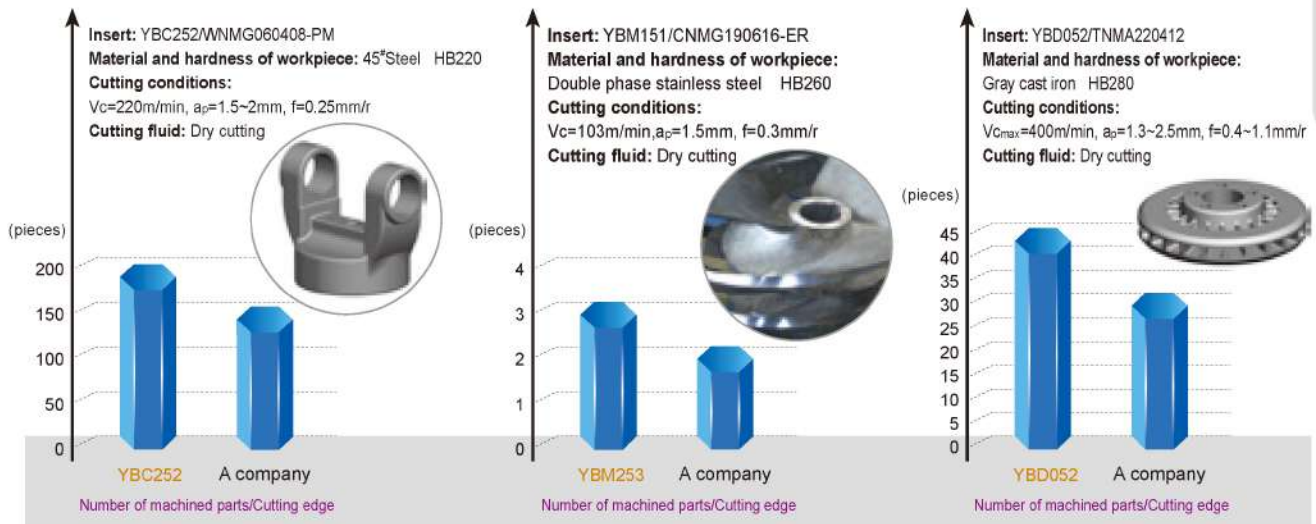
Recommended combination of grade and chipbreaker



Recommended cutting parameters

Workpiece material	Range of machining	Grade	Recommended cutting speed (m/min)
P Steel	For finishing	YBC152	220-500
	For semi-finishing	YBC252	180-480
	For roughing	YBC352	130-380
M Stainless steel	For finishing	YBM153	110-280
	For semi-finishing	YBM251	
	For roughing	YBM253	
K Cast iron	For finishing	YBD052	200-500
		YBD102	200-480
	For semi-finishing	YBD152	190-450

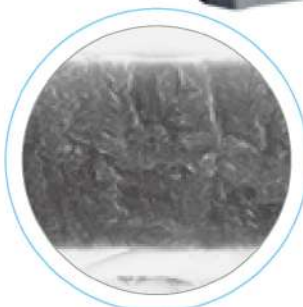
Case



Coated Cemented Carbide **PVD** makes it easy to machine materials which are hard to be machined

New nano coating grade

- Special coating techniques make inserts smooth, which leads to low friction and unobstructed chip flow.
- Unique coating with nano structure closely integrates with substrate, ensuring higher hardness and toughness.
- Excellent thermal stability and chemical stability can effectively protect cutting edge.



nc-TiAlN coating
(YBG202)



TiAlN base multi-elements
coating(YBG105)

High-performance nanostructure coating guarantees good toughness and hardness of inserts. Special coating technology guarantees smooth surface and excellent wear resistance. Outstanding thermal stability and chemical stability effectively protect cutting edge.

► **YBG102**

The combination of nc-TiAlN coating and fine grain substrate makes it suitable for turning of various materials and finishing and semi-finishing of high-temperature alloys.

► **YBG202**

nc-TiAlN coating and ultra-fine grain substrate makes it suitable for finishing and semi-finishing of various materials and turning of super alloy.

► **YBG302**

The combination of nc-TiAlN coating and tough cemented carbide substrate, which integrates security and wear resistance, makes it suitable for parting and grooving of various materials.

► **YBG105**

Finishing and semi-finishing for materials difficult to cut PVD coated grade

PVD coated grade, new TiAlN based multilayer coating, has higher wear resistance and Anti-thermal-oxidation ability. It is suitable for finishing and semi-finishing turning of various materials difficult to cut, such as high temperature alloy, heat resistant alloy, etc.

► **YBG205**

PVD coating grade for finishing of stainless steel
Suitable for relatively small workpieces which require high surface smoothness.

Superfine TiAlN nano coating added with wear-resistant and heat-resistant rare elements has high hardness and excellent heat-resistance, providing effective protection for the cutting edge. Special coating technology ensures stronger combination of coating and substrate. It is suitable for extra finishing of stainless steel.

► **YBG205H** *New*

It adopts high-cobalt ultra-fine grain matrix, and through special sintering process and tungsten toughness enhancement technology, the wear resistance, impact resistance and high temperature oxidation resistance are greatly improved. The new TiAlN-based composite coating effectively improves the hardness, thermal shock resistance, and crack expansion resistance of the coating, and is suitable for fine and semi-finish turning of stainless steel.

► **YBG212**

Nc-TiAlN coating combined with super tough substrate which made of super fine grain. It's suitable for finishing and roughing materials which are hard to be machined.

► **YBH053** *New*

Special high hard material processing grade

The high cobalt ultrafine particles are evenly distributed by special sintering process;

Excellent thermal conductivity and high temperature resistance, greatly improve the thermal crack resistance and plastic deformation resistance of the substrate, effectively prevent abnormal cutting edge failure;

Excellent red hardness and wear resistance of the substrate, greatly improve the life of the substrate, delay the size change of processing.

► **YBM215** *New*

PVD coating of multiple layer nanometer

Improved capability of grade's wear resistance and anti-high temperature increases the strength between grade and substrate and the tool stability. This grade is very suitable for turning for stainless steel.

► **YBS103** *New*

Turning grade for Ni-based S material

Fine wear resistance, and good capability against built-up edge and heat resistance. Suitable for turning of Ni-based materials.

Recommended combination of grade and chipbreaker



Recommended cutting parameters

Workpiece material	Range of machining	Grade	Recommended cutting speed (m/min)
P Steel	For finishing	YBG102	180-460
	For semi-finishing	YBG202 YBG205	150-380
M Stainless steel	For finishing ~ for semi-finishing	YBG202 YBG205 YBM215	170-300
S Heat resistant alloy Ti alloy	For finishing ~ for semi-finishing	YBG102	30-60
		YBG105	40-70
		YBG212	30-50
		YBS103	40-90
	For roughing	YBG102	20-40
		YBG105	30-40
		YBG212 YBS103	20-40 20-50

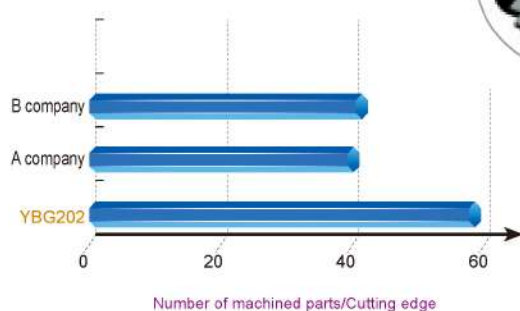
Case

Insert: YBG202/TNMG120404-EF

Hardness and material of workpiece: 0Cr18Ni9 HB240

Cutting conditions: $V_c=200\text{m/min}$, $a_p=1\text{mm}$,
 $f=0.15\text{mm/r}$

Cutting fluid: Dry cutting

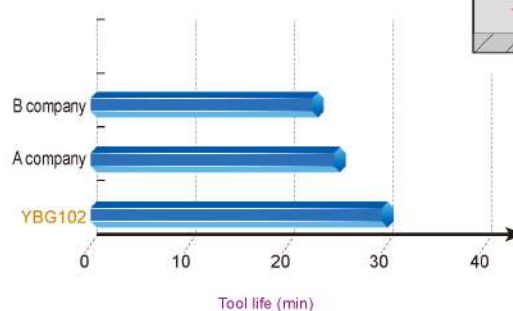


Insert: YBG102/DNEG150404-NF

Hardness and material of workpiece:

High temperature alloy Inconel 718 HRC $\geq$ 39
Cutting conditions: $V_c=80\text{m/min}$, $a_p=0.3\text{mm}$,
 $f=0.15\text{mm/r}$

Cutting fluid: Dry cutting



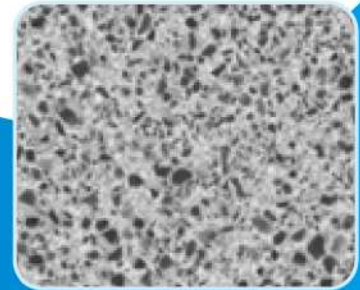
Cermet & Coated Cermet

The chemical stability between Ti(CN) base cermet inserts and workpieces is relatively high, which reduces the friction and temperature of the cutting edge during cutting, preventing mutual diffusion of atoms of the workpiece material and the inserts, and improving resistance to bonding abrasion. Therefore, Ti(CN) base cermet shows good capability of Red Hardness and resistance to crater wear. It is an optimal material for high-speed finishing and semi-finishing of steel. High temperature strength of cermet is higher than that of WC-Co, and toughness better than that of Al_2O_3 and Si_3N_4 ceramic. This fulfils the application blank of WC-base cemented carbide and Al_2O_3 and Si_3N_4 ceramic from finishing to semi-finishing at high speed.

Product features

Scientifically designed structure ensures good material performance and long tool life. Refined production management assures the stability of product quality.

- ✔ Symmetrical fine grain organization, together with the control of symmetrical organization and toric phase structure, improves the strength and hardness of cermet.
- ✔ Intensified bonding phase and well-designed grain boundary improve the high temperature capacity, heat conductivity and thermal vibration resistance.
- ✔ Coating of Physical Vapor Deposition (PVD) is applied to cermet substrate with high toughness, so that the grade has high hardness and toughness with wide-range application.



Substrate of cermet grade of YNG151 (homogenized ultra-fine structure)



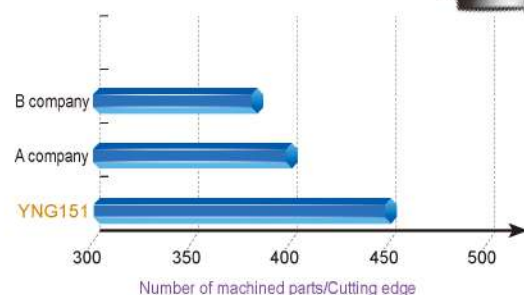
PVD coating organization structure of cermet

Recommended cutting parameters

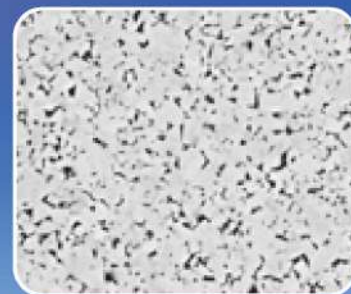
Workpiece material	Range of machining	Grade	Recommended cutting speed (m/min)
 Steel	For finishing	YNG151	260-550
		YNG151C	260-580
 Stainless steel		YNG151	170-330
		YNG151C	160-350
 Cast iron		YNG151	250-400
		YNG151C	270-420

Case

Insert: YNG151/CNMG120404-SF
Hardness and material of workpiece: 20CrMnTi HB180-223
Cutting parameters: $V_C=220\text{m/min}$
 $a_p=0.5\sim 1.0\text{mm}$
 $f=0.14\text{mm/r}$



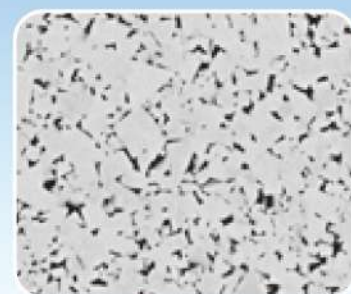
Outstanding chip breaking Good surface quality



Substrate of YD101: the combination of cemented carbide phase WC of fine grain and bonding phase Co

Cemented Carbide Grade

Uncoated cemented carbide grade is widely used for machining of non-ferrous metal, high temperature alloy, etc. It is economical and can be universally applied.



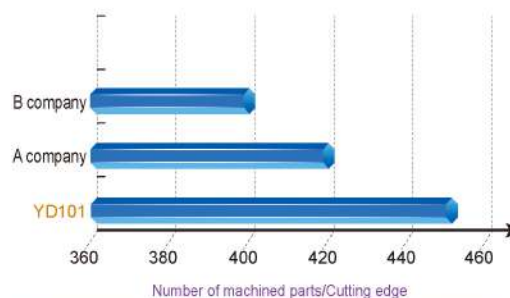
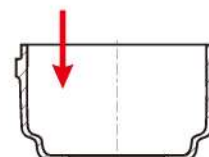
Substrate of YD201: the combination of cemented carbide phase WC of middle grain and bonding phase Co

Recommended cutting parameters

Workpiece material	Range of machining	Grade	Recommended cutting speed (m/min)
K Cast iron	For semi-finishing For roughing	YD201	60-130
N Non-ferrous metal	For finishing For semi-finishing	YD101	110-1750
S Heat resistant alloy Ti alloy	For finishing	YD101	20-50

Case

Insert: YD101/CCGX09T304-LH
Workpiece material: ZL105 HB70
Cutting parameters: $V_c=400\text{m/min}$
 $a_p=1\text{mm}$
 $f=0.3\text{mm/r}$



Workpiece has high surface quality and high dimensional precision.



Table of correctional coefficient between material hardness and cutting speed

Workpiece material	Theoretical Hardness	Correctional coefficient between hardness of materials and cutting speed								
		Hardness decrease ← Hardness difference(Measured value – Theoretical value) → Hardness increase								
		-60	-40	-20	0	+20	+40	+60	+80	+100
P	HB180	1.42	1.24	1.11	1.0	0.91	0.84	0.77	0.72	0.67
M	HB180	1.44	1.25	1.11	1.0	0.91	0.84	0.78	0.73	0.68
K	Grey cast iron	1.21	1.13	1.06	1.0	0.95	0.90	0.86	0.82	0.79
	Nodular cast iron	1.33	1.21	1.09	1.0	0.91	0.84	0.75	0.70	0.65
N	HB75			1.05	1.0	0.95				
S	HB350			1.12	1.0	0.89				
Rockwell hardness HRC			-6	-3	0	+3	+6	+9		
H	HRC60		1.10	1.02	1.0	0.96	0.93	0.90		
Actual Cutting Speed = Recommended Cutting Speed×Correctional Coefficient of Cutting Speed										

※Please find recommended cutting parameters on insert packing box.

Example: If the material you are going to machine is normal alloy steel, whose theoretical hardness is HB180, and the selected insert is CNMG120404-DF/YBC151, then the recommended cutting speed is $V=150\text{m/min}$. If the hardness measured value of the material is HB220, then the hardness difference value is $220-180=+40$. Correctional coefficient found in the table is 0.84. Therefore, the actual applicable cutting speed is $V_c=150 \times 0.84=126\text{m/min}$.

Correctional coefficient table between tool life and cutting speed

Tool life Insert materials	Correctional coefficient between tool life and cutting speed					
	10 minutes	15 minutes (Standard life)	30 minutes	45 minutes	60 minutes	90 minutes
YBC152	1.25	1.00	0.68	0.54	0.46	0.37
YBC252	1.55	1.00	0.47	0.30	0.22	0.14
YBM153	1.32	1.00	0.64	0.48	0.37	0.31
YBM215	1.22	1.00	0.85	0.77	0.72	0.67
YBM251	1.19	1.00	0.75	0.63	0.56	0.47
YBM253	1.22	1.00	0.73	0.61	0.54	0.45
YBG202	1.10	1.00	0.85	0.77	0.72	0.66
YBG205	1.15	1.00	0.82	0.74	0.69	0.64
YBD052	1.22	1.00	0.80	0.65	0.60	0.55
YBD102	1.20	1.00	0.75	0.62	0.58	0.50
YBD152	1.11	1.00	0.70	0.60	0.50	0.40
YBG105	1.28	1.00	0.79	0.72	0.63	0.58
YBG212	1.25	1.00	0.75	0.70	0.60	0.50
YBS103	1.35	1.00	0.85	0.78	0.68	0.62
Actual cutting speed = Recommended cutting speed × Correctional coefficient of cutting speed						
Example: If the material you are going to machine is normal alloy steel, and the selected insert is CNMG120404-DF/YBC151, then the recommended cutting speed is $V=250\text{m/min}$ (standard life is 15 minutes). If you expect the tool life to reach 60 minutes, the correctional coefficient found in the table is 0.67, then the applicable cutting speed is $V_c=250 \times 0.67=167.5\text{m/min}$.						